

## SEQUENCE LISTING

<110> AXXAM SRL

<120> photoproteins with enhanced bioluminescence and assays using the same

<130> 1009PCT

<160> 22

<170> PatentIn version 3.1

<210> 1

<211> 198

<212> PRT

<213> Clytia gregaria

<400> 1

Met Ala Asp Thr Ala Ser Lys Tyr Ala Val Lys Leu Arg Pro Asn Phe  
1 5 10 15

Asp Asn Pro Lys Trp Val Asn Arg His Lys Phe Met Phe Asn Phe Leu  
20 25 30

Asp Ile Asn Gly Asp Gly Lys Ile Thr Leu Asp Glu Ile Val Ser Lys  
35 40 45

Ala Ser Asp Asp Ile Cys Ala Lys Leu Gly Ala Thr Pro Glu Gln Thr  
50 55 60

Lys Arg His Gln Asp Ala Val Glu Ala Phe Phe Lys Lys Ile Gly Met  
65 70 75 80

Asp Tyr Gly Lys Glu Val Glu Phe Pro Ala Phe Val Asp Gly Trp Lys  
85 90 95

Glu Leu Ala Asn Tyr Asp Leu Lys Leu Trp Ser Gln Asn Lys Lys Ser  
100 105 110

2

Leu Ile Arg Asp Trp Gly Glu Ala Val Phe Asp Ile Phe Asp Lys Asp  
115 120 125

Gly Ser Gly Ser Ile Ser Leu Asp Glu Trp Lys Ala Tyr Gly Arg Ile  
130 135 140

Ser Gly Ile Cys Ser Ser Asp Glu Asp Ala Glu Lys Thr Phe Lys His  
145 150 155 160

Cys Asp Leu Asp Asn Ser Gly Lys Leu Asp Val Asp Glu Met Thr Arg  
165 170 175

Gln His Leu Gly Phe Trp Tyr Thr Leu Asp Pro Asn Ala Asp Gly Leu  
180 185 190

Tyr Gly Asn Phe Val Pro  
195

<210> 2

<211> 198

<212> PRT

<213> Unknown

<220>

<223> Clytin mutant: mutClyK1

<400> 2

Met Ala Asp Thr Ala Ser Lys Tyr Ala Val Lys Leu Arg Pro Asn Phe  
1 5 10 15

Asp Asn Pro Lys Trp Val Asn Arg His Lys Phe Met Phe Asn Phe Leu  
20 25 30

Asp Ile Asn Gly Asp Gly Lys Ile Thr Leu Asp Glu Ile Val Ser Lys  
35 40 45

Ala Ser Asp Asp Ile Ser Ala Lys Leu Gly Ala Thr Pro Glu Gln Thr  
50 55 60

Lys Arg His Gln Asp Ala Val Glu Ala Phe Phe Lys Lys Ile Gly Met  
65 70 75 80

Asp Tyr Gly Lys Glu Val Glu Phe Pro Ala Phe Val Asp Gly Trp Lys  
85 90 95

3

Glu Leu Ala Asn Tyr Asp Leu Lys Leu Trp Ser Gln Asn Lys Lys Ser  
100 105 110

Leu Ile Arg Asp Trp Gly Glu Ala Val Phe Asp Ile Phe Asp Lys Asp  
115 120 125

Gly Ser Gly Ser Ile Ser Leu Asp Glu Trp Lys Ala Tyr Gly Arg Ile  
130 135 140

Ser Gly Ile Cys Ser Ser Asp Glu Asp Ala Glu Lys Thr Phe Lys His  
145 150 155 160

Cys Asp Leu Asp Asn Ser Gly Lys Leu Asp Val Asp Glu Met Thr Arg  
165 170 175

Gln His Leu Gly Phe Trp Tyr Thr Leu Asp Pro Asn Ala Asp Gly Leu  
180 185 190

Tyr Gly Asn Phe Val Pro  
195

<210> 3

<211> 198

<212> PRT

<213> Unknown

<220>

<223> Clytin mutant: mutClyK4

<400> 3

Met Ala Asp Thr Ala Ser Lys Tyr Ala Val Lys Leu Arg Pro Asn Phe  
1 5 10 15

Asp Asn Pro Lys Trp Val Asn Arg His Lys Phe Met Phe Asn Phe Leu  
20 25 30

Asp Ile Asn Gly Asp Gly Lys Ile Thr Leu Asp Glu Ile Val Ser Lys  
35 40 45

Ala Ser Asp Asp Ile Cys Ala Lys Leu Gly Ala Thr Pro Glu Gln Thr  
50 55 60

Lys Arg His Gln Asp Ala Val Glu Ala Phe Phe Lys Lys Ile Gly Met  
65 70 75 80

4

Asp Tyr Gly Lys Glu Val Glu Phe Pro Ala Phe Val Asp Gly Trp Lys  
 85 90 95

Glu Leu Ala Asn Tyr Asp Leu Lys Leu Trp Ser Gln Asn Lys Lys Ser  
 100 105 110

Leu Ile Arg Asp Trp Gly Glu Ala Val Phe Asp Ile Phe Asp Lys Asp  
 115 120 125

Gly Ser Gly Cys Ile Ser Leu Asp Glu Trp Lys Ala Tyr Gly Arg Ile  
 130 135 140

Ser Gly Ile Cys Ser Ser Asp Glu Asp Ala Glu Lys Thr Phe Lys His  
 145 150 155 160

Cys Asp Leu Asp Asn Ser Gly Lys Leu Asp Val Asp Glu Met Thr Arg  
 165 170 175

Gln His Leu Gly Phe Trp Tyr Thr Leu Asp Pro Asn Ala Asp Gly Leu  
 180 185 190

Tyr Gly Asn Phe Val Pro  
 195

<210> 4

<211> 198

<212> PRT

<213> Unknown

<220>

<223> Clytin mutant: 1F10 mutant

<400> 4

Met Ala Asp Thr Ala Ser Lys Tyr Ala Val Lys Leu Arg Pro Asn Phe  
 1 5 10 15

Asp Asn Pro Lys Trp Val Asn Arg His Lys Phe Met Phe Asn Phe Leu  
 20 25 30

Asp Ile Asn Gly Asp Gly Lys Ile Thr Leu Asp Glu Ile Val Ser Arg  
 35 40 45

Ala Ser Asp Asp Ile Cys Ala Lys Leu Gly Ala Thr Pro Glu Gln Thr  
 50 55 60

5

Lys Arg His Gln Asp Ala Val Glu Ala Phe Phe Lys Lys Ile Gly Met  
 65 70 75 80

Asp Tyr Gly Lys Glu Val Glu Phe Pro Ala Phe Val Asp Gly Trp Lys  
 85 90 95

Glu Leu Ala Asn Tyr Asp Leu Lys Leu Trp Ser Gln Asn Lys Lys Ser  
 100 105 110

Leu Ile Arg Asp Trp Gly Glu Ala Val Phe Asp Ile Phe Asp Lys Asp  
 115 120 125

Gly Ser Gly Ser Ile Ser Leu Asp Glu Trp Lys Ala Tyr Gly Arg Ile  
 130 135 140

Ser Gly Ile Cys Ser Ser Asp Glu Asp Ala Glu Lys Thr Phe Lys His  
 145 150 155 160

Cys Asp Leu Asp Asn Ser Gly Lys Leu Asp Val Asp Glu Met Thr Arg  
 165 170 175

Gln His Leu Gly Phe Trp Tyr Thr Leu Asp Pro Asn Ala Asp Gly Leu  
 180 185 190

Tyr Gly Asp Phe Val Pro  
 195

<210> 5

<211> 198

<212> PRT

<213> Unknown

<220>

<223> Clytin mutant: 1H7 mutant

<400> 5

Met Ala Asp Thr Ala Ser Lys Tyr Ala Val Lys Leu Arg Pro Asn Phe  
 1 5 10 15

Asp Asn Pro Lys Trp Val Asn Arg His Lys Phe Met Phe Asn Phe Leu  
 20 25 30

Asp Ile Asn Gly Asp Gly Lys Ile Thr Leu Asp Glu Ile Val Ser Lys  
 35 40 45

6

Ala Ser Asp Asp Ile Cys Ala Lys Leu Gly Ala Thr Pro Glu Gln Thr  
 50 55 60

Lys Arg His Arg Asp Ala Val Glu Ala Phe Phe Lys Lys Ile Gly Met  
 65 70 75 80

Asp Tyr Gly Lys Glu Val Glu Phe Pro Val Phe Val Asp Gly Trp Lys  
 85 90 95

Glu Leu Ala Asn Tyr Asp Leu Lys Leu Trp Ser Gln Asn Lys Lys Ser  
 100 105 110

Leu Ile Arg Asp Trp Gly Glu Ala Val Phe Asp Ile Phe Asp Lys Asp  
 115 120 125

Gly Ser Gly Ser Ile Ser Leu Asp Glu Trp Lys Ala Tyr Gly Arg Ile  
 130 135 140

Ser Gly Ile Cys Ser Ser Asp Glu Asp Ala Glu Lys Thr Phe Lys His  
 145 150 155 160

Cys Asp Leu Asp Asn Ser Gly Lys Leu Asp Val Asp Glu Met Thr Arg  
 165 170 175

Gln His Leu Gly Phe Trp Tyr Ile Leu Asp Pro Asn Ala Asp Gly Leu  
 180 185 190

Tyr Gly Asn Phe Val Pro  
 195

<210> 6

<211> 198

<212> PRT

<213> Unknown

<220>

<223> Clytin mutant: 1C12 mutant

<400> 6

Met Ala Asp Thr Ala Ser Lys Tyr Ala Val Lys Leu Arg Pro Asn Phe  
 1 5 10 15

Asp Asn Pro Lys Trp Val Asn Arg His Lys Phe Met Phe Asn Phe Leu  
 20 25 30

7

Asp Ile Asn Gly Asp Gly Lys Ile Thr Leu Asp Glu Ile Val Ser Lys  
 35 40 45

Ala Ser Asp Asp Ile Cys Ala Lys Leu Gly Ala Thr Pro Glu Gln Thr  
 50 55 60

Lys Arg His Gln Asp Ala Val Glu Ala Phe Phe Lys Lys Ile Gly Met  
 65 70 75 80

Asp Phe Gly Lys Glu Val Glu Phe Pro Ala Phe Val Asp Gly Trp Lys  
 85 90 95

Glu Leu Ala Asn Tyr Asp Leu Lys Leu Trp Ser Gln Asn Asn Lys Ser  
 100 105 110

Leu Ile Arg Asp Trp Gly Glu Ala Val Phe Asp Ile Leu Asp Lys Asp  
 115 120 125

Gly Ser Gly Ser Ile Ser Leu Asp Glu Trp Lys Ala Tyr Gly Arg Ile  
 130 135 140

Ser Gly Ile Cys Arg Ser Asp Glu Asp Ala Glu Lys Thr Phe Lys His  
 145 150 155 160

Cys Asp Leu Asp Asn Ser Gly Lys Leu Asp Val Asp Glu Met Thr Arg  
 165 170 175

Gln His Leu Gly Phe Trp Tyr Thr Leu Asp Pro Asn Ala Asp Gly Leu  
 180 185 190

Tyr Gly Asn Phe Val Pro  
 195

<210> 7

<211> 198

<212> PRT

<213> Unknown

<220>

<223> Clytin mutant: 25N03b mutant

<400> 7

Met Ala Asp Thr Ala Ser Lys Tyr Ala Val Lys Leu Arg Pro Asn Phe  
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8

Asp Asn Pro Lys Trp Val Asn Arg His Lys Phe Met Phe Asn Phe Leu  
                   20                  25                  30  
  
 Asp Ile Asn Gly Asp Gly Lys Ile Thr Leu Asp Glu Ile Val Ser Lys  
                   35                  40                  45  
  
 Ala Ser Asp Asp Ile Cys Ala Lys Leu Gly Ala Thr Pro Glu Gln Thr  
                   50                  55                  60  
  
 Lys Arg His Gln Asp Ala Val Glu Ala Phe Phe Lys Lys Ile Gly Met  
   65                  70                  75                  80  
  
 Asp Tyr Gly Lys Glu Val Glu Phe Pro Ala Phe Val Asp Gly Trp Lys  
                   85                  90                  95  
  
 Glu Leu Ala Asn Tyr Asp Leu Lys Leu Trp Ser Gln Asn Lys Lys Ser  
                   100                  105                  110  
  
 Leu Ile Arg Asp Trp Gly Glu Ala Val Phe Asp Ile Phe Asp Lys Asp  
                   115                  120                  125  
  
 Gly Ser Gly Ser Ile Ser Leu Asp Glu Trp Lys Ala Tyr Cys Arg Ile  
   130                  135                  140  
  
 Ser Gly Ile Cys Ser Ser Asp Glu Asp Ala Glu Lys Thr Phe Lys His  
  145                  150                  155                  160  
  
 Cys Asp Leu Asp Asn Ser Gly Lys Leu Asp Val Asp Glu Met Thr Arg  
                   165                  170                  175  
  
 Gln His Leu Gly Phe Trp Tyr Thr Leu Asp Pro Asn Ala Asp Gly Leu  
                   180                  185                  190  
  
 Tyr Gly Asn Phe Val Pro  
                   195

&lt;210&gt; 8

&lt;211&gt; 198

&lt;212&gt; PRT

&lt;213&gt; Unknown

&lt;220&gt;

&lt;223&gt; Clytin mutant: 3C12 mutant



&lt;400&gt; 8

Met Ala Asp Thr Ala Ser Lys Tyr Ala Val Lys Leu Arg Pro Asn Phe  
1 5 10 15

Asp Asn Pro Lys Trp Val Asn Arg His Lys Phe Met Phe Asn Phe Leu  
20 25 30

Asp Ile Asn Gly Asp Gly Lys Ile Thr Leu Asp Glu Ile Val Ser Lys  
35 40 45

Ala Ser Asp Asp Val Cys Ala Lys Leu Gly Ala Thr Pro Glu Gln Thr  
50 55 60

Lys Arg His Gln Asp Ala Val Glu Ala Phe Phe Lys Lys Ile Gly Met  
65 70 75 80

Asp Tyr Gly Lys Glu Val Glu Phe Pro Ala Phe Val Asp Gly Trp Lys  
85 90 95

Glu Leu Ala Asn Tyr Asp Leu Lys Leu Trp Ser Gln Asn Lys Lys Ser  
100 105 110

Leu Ile Arg Asp Trp Gly Glu Ala Val Phe Asp Ile Phe Asp Lys Asp  
115 120 125

Gly Ser Gly Ser Ile Ser Leu Asp Glu Trp Lys Ala Tyr Gly Arg Ile  
130 135 140

Ser Gly Ile Cys Arg Ser Asp Glu Asp Ala Glu Lys Thr Phe Lys His  
145 150 155 160

Cys Asp Leu Asp Asn Ser Gly Lys Leu Asp Val Asp Glu Met Thr Arg  
165 170 175

Gln His Leu Gly Phe Trp Tyr Thr Leu Asp Pro Asn Ala Asp Gly Leu  
180 185 190

Tyr Gly Asn Phe Val Pro  
195

&lt;210&gt; 9

&lt;211&gt; 198

&lt;212&gt; PRT

&lt;213&gt; Unknown

&lt;220&gt;

&lt;223&gt; Clytin mutant: 6H22 mutant

&lt;400&gt; 9

Met Ala Asp Thr Ala Ser Lys Tyr Ala Val Lys Leu Arg Pro Asn Phe  
1 5 10 15

Asp Asp Pro Lys Trp Val Asn Arg His Lys Phe Met Phe Asn Phe Leu  
20 25 30

Asp Ile Asn Gly Asp Gly Lys Val Thr Leu Asp Glu Ile Val Ser Lys  
35 40 45

Ala Ser Asp Asp Ile Cys Ala Arg Leu Gly Ala Thr Pro Glu Gln Thr  
50 55 60

Lys Arg His Gln Asp Ala Val Glu Ala Phe Phe Lys Lys Ile Gly Met  
65 70 75 80

Asp Tyr Gly Lys Glu Val Glu Phe Pro Ala Phe Val Asp Gly Trp Lys  
85 90 95

Glu Leu Ala Asn Tyr Asp Leu Lys Leu Trp Ser Gln Asn Lys Lys Ser  
100 105 110

Leu Ile Arg Asp Trp Gly Glu Ala Val Phe Asp Ile Phe Asp Lys Asp  
115 120 125

Gly Ser Gly Ser Ile Ser Leu Asp Glu Trp Lys Ala Tyr Gly Arg Ile  
130 135 140

Ser Gly Ile Cys Ser Ser Asp Glu Asp Ala Glu Lys Thr Phe Lys His  
145 150 155 160

Cys Asp Leu Asp Asn Ser Gly Lys Leu Asp Val Asp Glu Met Thr Arg  
165 170 175

Gln His Leu Gly Phe Trp Tyr Thr Leu Asp Pro Asn Ala Asp Gly Leu  
180 185 190

Tyr Gly Asn Phe Val Pro  
195

&lt;210&gt; 10

&lt;211&gt; 198

&lt;212&gt; PRT

&lt;213&gt; Unknown

&lt;220&gt;

&lt;223&gt; Clytin mutant: 12mutCly

&lt;400&gt; 10

Met	Ala	Asp	Thr	Ala	Ser	Lys	Tyr	Ala	Val	Lys	Leu	Arg	Pro	Asn	Phe
1				5					10					15	

Asp	Asn	Pro	Lys	Trp	Val	Asn	Arg	His	Lys	Phe	Met	Phe	Asn	Phe	Leu
			20					25					30		

Asp	Ile	Asn	Gly	Asp	Gly	Lys	Ile	Thr	Leu	Asp	Glu	Ile	Val	Ser	Lys
		35					40					45			

Ala	Ser	Asp	Asp	Ile	Cys	Ala	Lys	Leu	Glu	Ala	Thr	Pro	Glu	Gln	Thr
	50					55					60				

Lys	Arg	His	Gln	Val	Cys	Val	Glu	Ala	Phe	Phe	Arg	Gly	Cys	Gly	Met
65					70					75					80

Glu	Tyr	Gly	Lys	Glu	Ile	Ala	Phe	Pro	Gln	Phe	Leu	Asp	Gly	Trp	Lys
				85					90					95	

Gln	Leu	Ala	Thr	Ser	Glu	Leu	Lys	Lys	Trp	Ala	Arg	Asn	Glu	Pro	Thr
			100					105					110		

Leu	Ile	Arg	Glu	Trp	Gly	Asp	Ala	Val	Phe	Asp	Ile	Phe	Asp	Lys	Asp
		115					120					125			

Gly	Ser	Gly	Ser	Ile	Ser	Leu	Asp	Glu	Trp	Lys	Ala	Tyr	Gly	Arg	Ile
	130					135					140				

Ser	Gly	Ile	Cys	Ser	Ser	Asp	Glu	Asp	Ala	Glu	Lys	Thr	Phe	Lys	His
145					150					155					160

Cys	Asp	Leu	Asp	Asn	Ser	Gly	Lys	Leu	Asp	Val	Asp	Glu	Met	Thr	Arg
				165					170					175	

Gln	His	Leu	Gly	Phe	Trp	Tyr	Thr	Leu	Asp	Pro	Asn	Ala	Asp	Gly	Leu
			180					185					190		

Tyr	Gly	Asn	Phe	Val	Pro
					195

<210> 11

<211> 600

<212> DNA

<213> Unknown

<220>

<223> Clytin mutant: mutClyK1\_dna

<400> 11

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tgggtgaacc ggcacaagtt catgttcaac ttcttgga tcaacggcga cggcaagatc	120
accctggacg agatcgtgag caaggccagc gacgacatct gcgccaagct gggcgccacc	180
cccgagcaga ccaagagaca ccaggacgcc gtggaggcct tcttcaagaa gatcggcatg	240
gactacggca aggaggtgga gttccccgcc ttcttgga gctggaagga gctggccaac	300
taccacctga agctgtggag ccagaacaag aagagcctca tcagggactg gggcgaggcc	360
gtgttcgaca tcttcgacaa ggacggcagc ggctgcatca gcctggatga gtggaaggcc	420
tacggcagaa tcagcggcat ctgcagcagc gacgaggacg ccgaaaagac cttcaagcac	480
tgcgacctgg acaacagcgg caagctggac gtggacgaga tgaccagaca gcacctggac	540
ttctggtaca ccctggaccc caatgccgac ggcctgtacg gcaacttcgt gccttgataa	600

<210> 12

<211> 600

<212> DNA

<213> Unknown

<220>

<223> Clytin mutant: mutClyK4\_dna

<400> 12

atggccgaca cgcagcaaa gtacgccgtg aagctgaggc ccaacttcga caaccccaag	60
tgggtgaacc ggcacaagtt catgttcaac ttcttgga tcaacggcga cggcaagatc	120
accctggacg agatcgtgag caaggccagc gacgacatct gcgccaagct gggcgccacc	180
cccgagcaga ccaagagaca ccaggacgcc gtggaggcct tcttcaagaa gatcggcatg	240
gactacggca aggaggtgga gttccccgcc ttcttgga gctggaagga gctggccaac	300
tacgacctga agctgtggag ccagaacaag aagagcctca tcagggactg gggcgaggcc	360

## 13

gtgttcgaca tcttcgacaa ggacggcagc ggctgcatca gcctggatga gtggaaggcc 420  
tacggcagaa tcagcggcat ctgcagcagc gacgaggacg ccgaaaagac cttcaagcac 480  
tgcgacctgg acaacagcgg caagctggac gtggacgaga tgaccagaca gcacctgggc 540  
ttctggtaca ccctggaccc caatgccgac ggctgtacg gcaacttcgt gccttgataa 600

<210> 13

<211> 600

<212> DNA

<213> Unknown

<220>

<223> Clytin mutant: 1F10 mutant\_dna

<400> 13

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tggggtgaacc ggcacaagtt catgttcaac ttcttgga tcaacggcga cggcaagatc 120  
acctggacg agatcgtgag cagggccagc gacgacatct gcgccaagct gggcgccacc 180  
cccgagcaga ccaagagaca ccaggacgcc gtggaggcct tcttcaagaa gatcggcatg 240  
gactacggca aggaggtgga gttccccgcc ttcgtggacg gctggaagga gctggccaac 300  
tacgacctga agctgtggag ccagaacaag aagagcctca tcagggactg gggcgaggcc 360  
gtgttcgaca tcttcgacaa ggacggcagc ggcagcatca gcctggatga gtggaaggcc 420  
tacggcagaa tcagcggcat ctgcagcagc gacgaggacg ccgaaaagac cttcaagcac 480  
tgcgacctgg acaacagcgg caagctggac gtggacgaga tgaccagaca gcacctgggc 540  
ttctggtaca ccctggaccc caacgccgac ggctgtacg gcgacttcgt gccttgataa 600

<210> 14

<211> 600

<212> DNA

<213> Unknown

<220>

<223> Clytin mutant: 1H7 mutant\_dna

<400> 14

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tgggtgaacc ggcacaagtt catgttcaat ttcctggaca tcaacggcga cggcaagatc 120  
accctggacg agatcgtgag caaggccagc gacgacatct gcgccaagct gggcgccacc 180  
cccgagcaga ccaagagaca ccgggacgcc gtggaggcct tcttcaagaa gatcggcatg 240  
gactacggca aggaggtgga gttccccgtc ttcgtggacg gctggaagga gctggccaac 300  
tacgacctga agctgtggag ccagaacaag aagagcctca tcagggactg gggcgaggcc 360  
gtgtttgaca tcttcgacaa ggacggcagc ggcagcatta gcctggatga gtggaaggcc 420  
tacggtagaa tcagcggcat ctgcagcagc gacgaggacg ccgaaaagac cttcaagcac 480  
tgcgacctgg acaacagcgg caagctggac gtggacgaga tgaccagaca gcacctgggc 540  
ttctggtaca tcctggaccc caacgccgac ggctgtacg gcaacttcgt gccttgataa 600

<210> 15

<211> 600

<212> DNA

<213> Unknown

<220>

<223> Clytin mutant: 1C12 mutant\_dna

<400> 15

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tgggtgaacc ggcacaagtt catgttcaac ttcctggaca tcaacggcga cggcaagatc 120  
accctggacg agatcgtgag caaggccagc gacgacatct gcgccaagct gggcgccacc 180  
cccgagcaga ccaagagaca ccaggacgcc gtggaggcct tcttcaagaa gatcggcatg 240  
gacttcggca aggaggtgga gttccccgcc ttcgtggacg gctggaagga gctggccaac 300  
tacgacctga agctgtggag ccagaacaat aagagcctca tcagggactg gggcgaggcc 360  
gtgttcgaca tcctcgacaa ggacggcagc ggcagcatca gcctggatga gtggaaggcc 420  
tacggcagaa tcagcggcat ctgcagaagc gacgaggacg ccgaaaagac cttcaagcac 480  
tgcgacctgg acaacagcgg caagctggac gtggacgaga tgaccagaca gcacctgggc 540  
ttctggtaca ccctggaccc caacgccgac ggctgtacg gcaacttcgt gccttgataa 600

<210> 16

<211> 600

<212> DNA

<213> Unknown

<220>

<223> Clytin mutant: 25N03b mutant\_dna

<400> 16

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tgggtgaacc ggcacaagtt catgttcaac ttcctggaca tcaacggcga cggcaagatc   120
accctggacg agatcgtgag caaggccagc gacgacatct gcgccaagct gggcgccacc   180
cccgagcaga ccaagagaca ccaggacgcc gtggaggcct tcttcaagaa gatcggcatg   240
gactacggca aggaggtgga gttccccgcc ttcgtggacg gctggaagga gctggccaac   300
tacgacctga agctgtggag ccagaacaag aagagcctca tcagggactg gggcgaggcc   360
gtgttcgaca tcttcgacaa ggacggcagc ggcagcatca gcctggatga gtggaaggcc   420
tactgcagaa tcagcggcat ctgcagcagc gacgaggacg ccgaaaagac cttcaagcac   480
tgcgacctgg acaacagcgg caagctggac gtggacgaga tgaccagaca gcacctgggc   540
ttctggtaca ccctggaccc caacgccgac ggctgtacg gcaacttcgt gccttgataa   600
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<210> 17

<211> 600

<212> DNA

<213> Unknown

<220>

<223> Clytin mutant: 3C12 mutant\_dna

<400> 17

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atggccgaca cgcgcagcaa gtacgccgtg aagctgaggc ccaacttcga caacccaag    60
tgggtgaacc ggcacaagtt catgttcaac ttcctggaca tcaacggcga cggcaagatc   120
accctggacg agatcgtgag caaggccagc gacgacgtct gcgccaagct gggcgccacc   180
cccgagcaga ccaagagaca ccaggacgcc gtggaggcct tcttcaagaa gatcggcatg   240
gactacggca aggaggtgga gttccccgcc ttcgtggacg gctggaagga gctggccaac   300
tacgacctga agctgtggag ccaaaacaag aagagcctca tcagggactg gggcgaggcc   360
gtgttcgaca tcttcgacaa ggacggcagc ggcagcatca gcctggacga gtggaaggcc   420
tacggcagaa tcagcggcat ctgcagaagc gacgaggacg ccgaaaagac cttcaagcac   480
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## 16

tgcgacctgg acaacagcgg caagctggac gtggacgaga tgaccagaca gcacctgggc 540  
ttctggtaca ccctggaccc caacgccgac ggctgtacg gcaacttcgt gccttgataa 600

<210> 18

<211> 600

<212> DNA

<213> Unknown

<220>

<223> Clytin mutant: 6H22 mutant\_dna

<400> 18

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tgggtgaacc ggcacaagtt catgttcaac ttcttgga tcaacggcga cggcaaggtc 120  
accctggacg agatcgtgag caaggccagc gacgacatct gcgccaggct gggcgccacc 180  
cccgagcaga ccaagagaca ccaggacgcc gtggaggcct tcttcaagaa gatcggcatg 240  
gactacggca aagaggtgga gttccccgcc ttcgtggacg gctggaagga gctggccaac 300  
tacgacctga agctgtggag ccagaacaag aagagcctca tcagggactg gggcgaggcc 360  
gtgttcgaca tcttcgacaa ggacggcagc ggcagcatca gcctggatga gtggaaggcc 420  
tacggcagaa tcagcggcat ctgcagcagc gacgaggacg ccgaaaagac cttcaagcac 480  
tgcgacctgg acaacagcgg caagctggac gtggacgaga tgaccagaca gcacctgggc 540  
ttctggtaca ccctggaccc caacgccgac ggctgtacg gcaacttcgt gccttgataa 600

<210> 19

<211> 597

<212> DNA

<213> Unknown

<220>

<223> Clytin mutant: 12mutCly\_dna

<400> 19

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